Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of the Claims:

1. (Currently Amended) A method for reducing atmospheric scintillation in a beam of light transmitted across a free space, the method comprising:

~~(a)~~ generating a substantially single mode phase incoherent beam of light with a light emitting diode (LED) so as to produce said phase incoherent beam of light ~~having a narrow spectral range~~;

externally modulating the phase incoherent beam of light with data for communicating data to a destination across free space at a data rate that is no less than one Gb/s;

~~(b)~~ collimating the phase incoherent beam of light; and

~~(c)~~ propagating the phase incoherent collimated beam of light across the free space for long range communications transmission, wherein the single mode phase incoherent beam of light reduces atmospheric scintillation when transmitted across the free space and optimizes energy efficiency of the light transmission.

2. (Canceled)

3. (Currently Amended) The method of claim 1, wherein generating ~~step (a)~~ further includes:

~~(a.1)~~ generating the incoherent beam of light with a superluminescent light emitting diode.

4. (Currently Amended) The method of claim 1, wherein generating ~~step (a)~~ further includes:

~~(a.1)~~ generating the incoherent beam of light with a fiber-optic coupled light emitting diode.

5. (Currently Amended) The method of claim 1, wherein generating ~~step (a)~~ includes:

~~(a.1)~~ generating the incoherent beam of light with a fiber-optic coupled superluminescent light emitting diode.

6. (Currently Amended) The method of claim 1, ~~wherein step (a) further includes:~~

~~(a.1)~~ and further comprising amplifying the incoherent beam of light with a light amplifier.

7. (Currently Amended) The method of claim 1, ~~wherein step (a) further includes:~~

~~(a.1)~~ and further comprising amplifying the incoherent beam of light with an Erbium Doped Fiber Amplifier.

8. (Currently Amended) The method of claim 1, wherein generating ~~step (a) further includes:~~

~~(a.1)~~ generating the incoherent beam of light with a bandwidth limiting light emitting diode.

9. (Currently Amended) The method of claim 1, ~~wherein step (a) further includes:~~

~~(a.1)~~ and further comprising filtering the incoherent beam of light to generate an incoherent beam of light containing a reduced wavelength spectrum.

10. (Currently Amended) The method of claim 1, ~~wherein step (a) further includes:~~

~~(a.1)~~ and further comprising bandwidth limiting the incoherent beam into a plurality of bandwidth channels.

11. (Currently Amended) The method of claim 1, wherein collimating comprises ~~step (b) further includes:~~

~~(b.1)~~ collimating the beam of light with a gradient index lens.

12. (Currently Amended) The method of claim 1, wherein wherein collimating comprises ~~step (b) further includes:~~

~~(b.1)~~ collimating the beam of light with one of a conventional optical lens and an optical mirror.

13. (Currently Amended) The method of claim 1, and further comprising ~~wherein step (c) further includes:~~

~~(c.1)~~ focusing the beam of light onto a primary focal plane of a telescope.

14. (Currently Amended) The method of claim 1, and further comprising ~~wherein step (c) further includes:~~

~~(c.1)~~ directing the optical beam towards an optical receiver using active pointing techniques.

15. (Currently Amended) The method of claim 1, and further comprising ~~wherein step (c) further includes:~~

~~(c.1)~~ directing the optical beam towards an optical receiver using static pointing techniques.

16 and 17. (Canceled)

18. (Currently Amended) The method of claim 16, wherein modulating comprises ~~step (d) further includes:~~

~~(d.1)~~ modulating the beam using an interferometer to toggle the light beam to at least one of on and off.

19. (Currently Amended) The method of claim 16, wherein modulating comprises ~~step (d) further includes:~~

~~(d.1)~~ modulating wavelength division multiplexing channels within the beam of light.

20. (Currently Amended) The method of claim 1, and further comprising:

~~(e)~~ receiving the incoherent beam from free space.

21. (Currently Amended) The method of claim 20, wherein receiving comprises ~~step (e) further includes:~~

~~(e.1)~~ tracking the received beam of light using active pointing and tracking techniques.

22. (Currently Amended) The method of claim 20, wherein receiving comprises ~~step (e) further includes:~~

~~(e.1)~~ detecting at least one of light and darkness within the received beam of light, thereby producing a received data stream.

23. (Currently Amended) The method of claim 22, and further comprising ~~wherein step (e.1) further includes: (e.1.1)~~ demodulating the received data stream.

24. (Currently Amended) An apparatus for transmitting a beam of light across a free space in a manner that reduces atmospheric scintillation in the transmitted beam of light, comprising:

a light emitting diode (LED) to generate a substantially single mode phase incoherent beam of light ~~having a narrow spectral range~~;

an external modulator coupled to the LED that modulates the phase incoherent beam of light with data for communicating data to a destination across free space at a data rate that is no less than one Gb/s;

a collimating optics to collimate the beam of light; and

a propagating optics to propagate the phase incoherent collimated beam of light across the free space, wherein the single mode incoherent beam of light reduces atmospheric scintillation when transmitted across the free space.

25. (Currently Amended) The apparatus of claim 24, wherein the light emitting diode (LED) is a superluminescent light emitting diode.

26. (Currently Amended) The apparatus of claim 24, wherein the light emitting diode (LED) is a fiber-optic coupled light emitting diode.

27. (Currently Amended) The apparatus of claim 24, wherein the light emitting diode (LED) is a fiber-optic coupled superluminescent light emitting diode.

28. (Currently Amended) The apparatus of claim 24, further comprising:

a light amplifier to amplify the incoherent beam of light.

29. (Currently Amended) The apparatus of claim 28, wherein the light amplifier is an Erbium Doped Fiber Amplifier.

30. (Currently Amended) The apparatus of claim 24, wherein the light emitting diode is a bandwidth limiting light emitting diode.

31. (Currently Amended) The apparatus of claim 24, wherein the light emitting diode further includes:

a filter to bandwidth limit the generated incoherent beam

32. (Currently Amended) The apparatus of claim 24, wherein the collimating optics is a gradient index lens.

33. (Currently Amended) The apparatus of claim 24, wherein the collimating optics is one of a conventional optical lens and an optical mirror.

34. (Currently Amended) The apparatus of claim 24, wherein the propagating optics is a telescope.

35. (Currently Amended) The apparatus of claim 24, wherein the propagating optics further includes: an active pointing and tracking module to control the direction in which the incoherent beam is propagated.

36. (Currently Amended) The apparatus of claim 24, wherein the propagating optics further includes: a static pointing module to control the direction in which incoherent beam is propagated.

37 and 38. (Canceled)

39. (Currently Amended) The apparatus of claim 37, wherein the external modulator is an interferometer to toggle the light beam to at least one of on and off.

40. (Currently Amended) The apparatus of claim 37, wherein the modulator further includes:

a wavelength division multiplexing module to modulate wavelength division multiplexing channels within the beam of light.

41-43. (Canceled)

44. (Currently Amended) A transmitter for use in an optical light beam data link capable of transmitting a beam of light across a free space in a manner that reduces atmospheric scintillation in the transmitted beam of light for long range communications transmission, comprising:

a light emitting diode (LED) to generate a substantially single mode phase incoherent beam of light ~~having a narrow spectral range~~ that reduces atmospheric scintillation when transmitted across the free space;

an external modulator ~~to encode~~ that modulates data ~~upon~~ on the phase incoherent beam of light for communicating data to a destination across free space at a data rate that is no less than one Gb/s; and

a collimating optics to collimate the incoherent beam of light;

wherein the light emitting diode (LED) is a fiber-optic coupled superluminescent light emitting diode.

45. (Original) The apparatus of claim 44, further comprising:

a propagating optics to propagate the phase incoherent collimated beam of light across the free space.

46. (Original) The apparatus of claim 44, further comprising:

a pointing module to point the transmitted beam of light using active pointing and tracking techniques in the direction of an intended receiver.

47. (Currently Amended) A method for optical communication across a free space, comprising:

(a) generating a substantially singe mode phase incoherent beam of light ~~having a narrow spectral range~~ with a superluminescent light emitting diode;

(b) collimating the beam of light;

(c) externally modulating the beam of light with data to be transmitted from source to a destination across the free space, wherein the source and the destination are separated by a distance of at least one kilometer, said externally modulating comprises modulating the beam of light with data for communicating data to the destination across free space at a data rate that is no less than one Gb/s; and

(d) propagating the modulated beam of light across the free space from the source to the destination, wherein the single mode phase incoherent beam of light reduces atmospheric scintillation in the free space and optimizes energy efficiency of the light transmission.

48-51. (Canceled)

52. (Currently Amended) A method for optical communication across a free space, comprising:

(a) generating a substantially singe mode phase incoherent beam of light ~~having a spectral range of 40 nm or less~~;

(b) collimating the beam of light;

(c) externally modulating the beam of light with data to be transmitted from source to a destination across the free space, wherein the source and the destination are separated by a distance of at least one kilometer, said externally modulating comprises modulating the beam of light with data for communicating to the destination across free space at a data rate that is no less than one Gb/s; and

(d) propagating the modulated beam of light across the free space from the source to the destination, wherein the single mode phase incoherent beam of light reduces atmospheric scintillation in the free space and optimizes energy efficiency of the light transmission.